



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,230	04/08/2004	Mark B. Fuselier	2000.092182	9406
23720	7590	01/04/2005	EXAMINER	
WILLIAMS, MORGAN & AMERSON, P.C. 10333 RICHMOND, SUITE 1100 HOUSTON, TX 77042			KANG, DONGHEE	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/821,230

Applicant(s)

FUSELIER ET AL

Examiner

Donghee Kang

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/08/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. This application appears to be a division of Application No. 10/109,096, filed 03-28-02. A later application for a distinct or independent invention, carved out of a pending application and disclosing and claiming only subject matter disclosed in an earlier or parent application is known as a divisional application or "division." The divisional application should set forth the portion of the earlier disclosure that is germane to the invention as claimed in the divisional application.

Information Disclosure Statement

2. Acknowledgment is made of receipt of applicant's Information Disclosure Statement (PTO-1449) filed April 08, 2004.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-5, 7-11, 13-16, 18-21, 23-25, & 27-29 are rejected under 35 U.S.C. 102(e) as being applied by Riccobene (US 6,515,333).

Re claims 1, Riccobene teaches a semiconductor device, comprising (Fig.1):

a bulk substrate (18); a multiple thickness buried oxide layer (16) formed above said bulk substrate; and an active layer (14) formed above said multiple thickness buried oxide layer, said semiconductor device being formed in said active layer above said multiple thickness buried oxide layer. See also Col.3, lines 13-32.

Re claims 2 & 14, Riccobene teaches said bulk substrate is comprised of silicon (Col.3, line 16).

Re claim 3, Riccobene teaches said semiconductor device is a transistor.

Re claims 5, 16, & 25, Riccobene teaches said active layer is comprised of silicon.

Re claims 7, 18, & 27, Riccobene teaches said buried oxide layer is comprised of silicon dioxide (Col.4, lines 45-49).

Re claims 8, Riccobene teaches said multiple thickness buried oxide layer comprises:

A first section positioned between two second section, said first section having a thickness and each of said second sections having a thickness, said thickness of said first section being less than said thickness of said second sections.

Re claim 9, Riccobene teaches said semiconductor device is a transistor having a channel region, at least a portion of said channel region being positioned above a section of said buried oxide layer that has a thickness that is less than a thickness of a remaining portion of said buried oxide layer.

Re claim 10, Riccobene teaches said semiconductor device is a transistor comprised of a gate electrode (34) and wherein said multiple thickness buried oxide

layer has a first section positioned between two sections, said first section having a thickness and each of said second sections having a thickness, said thickness of said first section being less than a thickness of said second sections, said first section being at least partially positioned under said gate electrode.

Re claim 11, Riccobene teaches said semiconductor device is a transistor comprised of a gate electrode and wherein said multiple thickness buried oxide layer has a first section positioned between two second sections, said first section having a thickness and each of said second sections having a thickness, said thickness of said first section being less than a thickness of said second sections, said first section being substantially aligned with said gate electrode.

Re claim 13, Riccobene teaches a transistor, comprising (Fig.1):

A bulk substrate (18); a buried oxide layer (16) above said bulk substrate, said buried oxide layer comprising a first section positioned between two second sections, said first section having a thickness and each of said second sections having a thickness, said thickness of said first section being less than said thickness of said second sections; and an active layer (14) formed above said buried oxide layer, said transistor being formed in said active layer above said buried oxide layer.

Re claims 15 & 24, Riccobene teaches said transistor is part of at least one of a microprocessor, a memory device and a logic device.

Re claim 19, Riccobene teaches said transistor comprises a channel region, at least a portion of said channel region being positioned above at least a portion of said first section of said buried oxide layer.

Re claims 20 & 28, Riccobene teaches said transistor comprises a gate electrode (34) and wherein said first section of buried oxide layer is at least partially positioned under said gate electrode.

Re claims 21 & 29, Riccobene teaches said transistor comprises a gate electrode (34) and wherein said first section of buried oxide layer is substantially aligned with said gate electrode.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6, 12, 17, 22, 26 & 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riccobene (US 6,515,333).

Re claims 6, 17 & 26, Riccobene teaches said active layer has a thickness ranging from 500 ~ 1500 Å. Although Riccobene does not explicitly teach the thickness ranging from 5 ~ 30 nm, it is an obvious matter of routine experimentation to find the optimal thickness ranges. Generally, difference in thickness will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such thickness is critical.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the thickness of the active layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering

the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Re claims 12, 22, & 30, Riccobene teaches said first section has a thickness ranging from 100-500 Å which is from 10% to 25% of the thickness of said second section (Col.3, lines 61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the thickness of the buried oxide layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

See also MPEP 2144.05. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed.Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.); *In re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997) (Claim reciting thickness of a protective layer as falling within a range of "50 to 100 Angstroms" considered prima facie obvious in view of prior art reference teaching that "for suitable protection, the thickness of the protective layer should be not less than about 10 nm [i.e., 100Angstroms]." The court stated that "by stating that suitable protection' is

provided if the protective layer is about' 100 Angstroms thick, [the prior art reference] directly teaches the use of a thickness within [applicant's] claimed range.").

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 571-272-1656. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Donghee Kang, Ph.D.
Primary Examiner
Art Unit 2811

dhk